

REMARKS

Claims 1, 2, 5 and 6 were pending.

Claim 1 has been amended to correct a minor typographical error – specifically, to replace the “percent” symbol (%) with the “degree” symbol (°). The claim erroneously recited “90% heat seam peel strength” and now has been corrected to recite “90° heat seam peel strength.” This correction is appropriate, as evident throughout the disclosure of the present invention, e.g., in the Specification as filed, page 3, lines 10-12.

Claim 6 has been amended to more particularly point out certain embodiments of the invention, specifically, that both of said cap and base layers are produced by a process comprising combining, by weight: (a) 50-90% of the polymeric components of the cap and base layers of metallocene-catalyzed polyethylene; (b) an ethylene-propylene rubber (EPR); and (c) a crystallinity enhancing polymer comprising one of the following:

- (i) high density polyethylene (HDPE) having a crystallinity of 67 wt.%; and
- (ii) polypropylene (PP) having a crystallinity of 50 wt.%.

Support for these amendments can be found throughout the disclosure of the present invention, e.g., in the Specification as filed, page 5, lines 12-17 and original claim 1 as filed. Therefore, no new matter has been added.

Claims 1, 2, 5 and 6 are pending.

I. **Rejections Under 35 U.S.C. § 112**

Claim 6 has been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicant respectfully traverses.

As amended, independent claim 6 more particularly recites that the “50-90 %” by weight limitation refers to the polymeric components of the cap and base layers of metallocene-catalyzed polyethylene; and further, the presence of a crystallinity enhancing polymer comprising one of the following: (i) high density polyethylene (HDPE) having a crystallinity of 67 wt.%; and (ii) polypropylene (PP) having a crystallinity of 50 wt.%.

Further, the term “crystallinity” is used throughout the present invention in a manner as understood by one of ordinary skill in the art – that is, the degree of order of polymer molecular structure in a solid, and the degree to which the molecules are arranged in a regular, periodic manner (in contrast to the term “amorphous”).

For at least these reasons, Applicant respectfully submits that the rejection of claim 6 under 35 U.S.C. § 112, second paragraph, has been overcome and should be withdrawn.

II. Rejections Under 35 U.S.C. § 103(a)

Claims 1, 2 and 5 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,544,909 to Venkataswamy et al. (“Venkataswamy”) in view of U.S. Patent No. 5,256,228 to Davis et al. (“Davis”). Applicant respectfully traverses.

First, it is acknowledged that Venkataswamy does not teach each and every element of the present claims, because, *inter alia*, this reference “do[es] not state that their roofing membrane comprises a HDPE, as a crystallinity enhancing polymer” (Office Action, page 4).

Next, the teachings of Davis do not cure this defect. First, there is no motivation to combine the teachings of Davis with those of Venkataswamy. Davis is concerned primarily with roofing sheeting material that is comprised of ethylene-propylene-diene terpolymers (EPDM). This is very different material from the thermoplastic polyolefin (TPO) roofing membranes of

the present invention, as recited in the pending claims. Davis teaches that HDPE can be combined with EPDM based roofing materials as a “thermoplasticity promoter” (Davis, col. 4, lines 47-50). Davis further teaches that EPDM tends lack adhesion, and therefore an adhesive is often required to bond together layers of the EPDM (Davis, col. 1, lines 35-52).

In contrast, in the presently claimed compositions, the HDPE is included as a crystallinity enhancing polymer to further provide superior heat peel strengths and ultra low temperature flexibility. Because Davis teaches the addition of HDPE for adhesion purposes, and because TPO membranes do not exhibit the lack of adhesion of EPDM based roofing materials, a skilled artisan viewing Davis and Venkataswamy would not be motivated to combine their teachings in developing roofing material, because there is no suggestion or motivation in Davis that HDPE would be useful to improve adhesion when combined with TPO membranes rather than EPDM based roofing materials.

Further, even if there were a motivation to combine the teachings of the two references, there would be no expectation of success in combining the HDPE of Davis with a thermoplastic polyolefin (TPO) roofing membrane. EPDM roofing sheeting material does not exhibit advantages such as the superior heat peel strengths and ultra low temperature flexibility that are observed with the roofing membranes of the present invention. In fact, the present inventors discuss the knowledge in the art, as stated in the Specification of the present invention, that EPDM based roof sheeting exhibits disadvantages such as its requirement for the use of adhesive for joining and sealing the edges of membranes due to the lack of adhesion (Specification, page 1, lines 23-26).

Thus, a skilled artisan would not have looked to reinforce a TPO based roof sheeting material with HDPE based on the teachings of Venkataswamy and/or Davis, and would have had

no expectation of success in such a combination. This is further supported by the evidence of Venkatswamy and Davis themselves. Specifically, the roofing membranes of the present invention exhibit superior seam peel strength (*e.g.*, 66 lbs/linear inch as shown in Table 1) and cold brittleness points (*e.g.*, -58° C as shown in Table 2) compared to the roofing materials of Davis, as shown in Table V of Davis (peel adhesion at 23° C < 30 lbs/linear inch) and Table IV of Davis (cold brittleness point > -50° C).

Thus, Applicant respectfully submits that a *prima facie* case of obviousness has not been established with regard to claims 1, 2 and 5 based on the teachings of Venkatswamy and Davis.

For at least these reasons, Applicant respectfully submits that the rejection of these claims under 35 U.S.C. § 112, second paragraph, has been overcome and should be withdrawn.

In view of the above amendments and remarks, Applicant believes that each of the pending claims is in condition for allowance, early notice of which is earnestly solicited. Should any outstanding issues remain, the Examiner is invited to contact Applicant's undersigned attorneys at the telephone number below.

No fees, other than the fee for extension of time, are believed to be due for the filing of this Amendment and Response. However, the Director is hereby authorized to charge all fees due or credit any overpayments to Deposit Account No. 03-1250, Reference No. FDN-2794/CIP, Customer No. 43,309.

Respectfully submitted,

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